

CHARGE NUMBER: 4009

PROJECT TITLE: Development Smoke Studies

PROJECT LEADER: B. L. Goodman

PERIOD COVERED: February, 1983

I. PROJECT SLOW (K. Gunst)

Objectives:

Determine the effect of cigarette components on sidestream visibility.

Develop a reduced sidestream product that is subjectively acceptable.

Status:

Measurements of light extinction gave similar values for a nonporous control cigarette wrapper and one with potassium acetate coating. The coating reduced the static burn time and gave a 25% reduction in sidestream TPM. The appearance of the ash was also greatly enhanced.

Glutaric acid on the wrapper gave a 10% reduction in the amount of light extinguished compared to a nonporous control. TPM reduction was 20% at an equivalent static burn time.

Citric acid gave reductions in both visibility and TPM, but the level was not significant compared to the nonporous control. Nonporous wrappers have previously shown to reduce the visibility of sidestream smoke by 30-35% without any coating.

Plans:

To coat wrapper with potassium glutarate for potential reduction of sidestream TPM.

Measure sidestream visibility and tar on selected commercial brands and experimental cigarettes.

Design an optimum model with reduced sidestream and acceptable taste, odor and delivery.

II. COMPUTER APPLICATIONS (R. Greene)

Objective:

To write programs in BASIC and provide user assistance for the directorate.

Results:

Two library directories have been created for the Cigarette Development Division and the Flavor Development Division. These libraries are open to computer users in either division and provide sample command files, demonstrations for the novice user and various automatic programs to facilitate computer tasks. Most of the computer directories in the division have been modified to access this library.

Several small programs were written and added to the BASIC library. They include a file reformatting program to transform column data files and output raw data files, several upgrades to "BASIC-PLUS-2 to EASYGRAPH UTILITY ROUTINES" and creation of additional string array processing subprograms. Most of the changes were implemented in

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routine maintenance of the large programs delivery, onecurve, rate, propburn, math-pack and tipanal. The onecurve program has been updated to allow data merging of several file sections for additional statistical analysis.

An APL function has been written by Dr. Hartung to allow file communication between delivery and the APL modeling package.

III. SMOKER SIMULATOR PROGRAM (M. Kelley, R. Arthur)

Objective:

To evaluate, update, and utilize Human Simulator equipment.

Status:

The new four port Simulator has been installed in its permanent location. Preparation of command tapes or discs with the input of human smoking data has given the desired data. That portion of the program is now in the process of being converted to the DEC by CAD personnel.

Reproducibility of the puff volume has given some problems. The testing indicated that the thickness of the Cambridge pad is critical. If it is less than 1.000" thick, there is loss of volume, and if it is more than 1.014" there is binding in the transfer mechanism. New springs have been ordered.

The built-in puff selections were reprogrammed to permit variable puff intervals. They can now be set at 35 seconds or longer by the operator.


The single port machine was used for smoking experimental cigarettes for nicotine changes due to various treatments of the tobacco. The cigarettes were made by P. Martin's project and the results were forwarded to them.

Another short study of differences in smoking profiles between a control cigarette and a new product was completed using the PPA to measure puff volumes and durations. No differences in profiles were seen for the eleven panelists.

Plans:

To complete the evaluation of new equipment and install modified parts.

Complete the conversion of all Simulator functions to the DEC.


B. Goodman

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